

FIG. 1(A)(1)

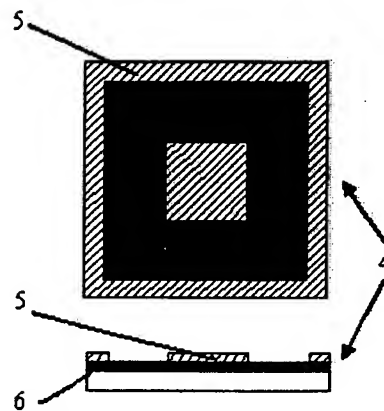


FIG. 1(A)(2)

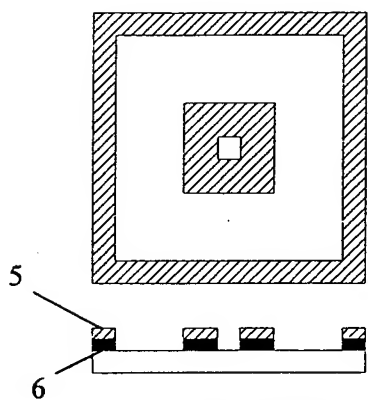


FIG. 1(B)(1)

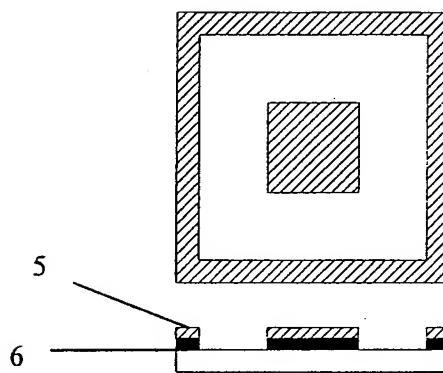


FIG. 1(B)(2)

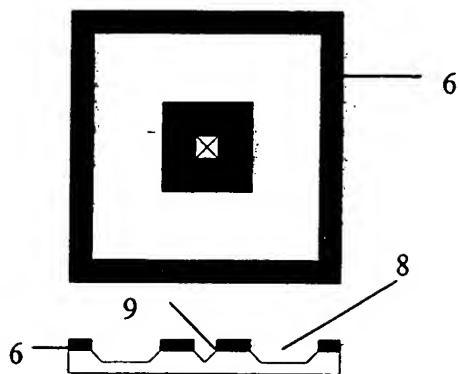


FIG. 1(C)(1)

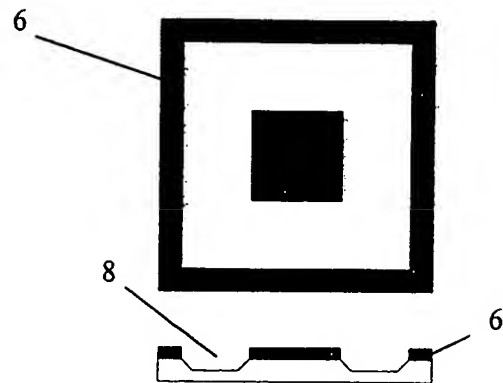


FIG. 1(C)(2)

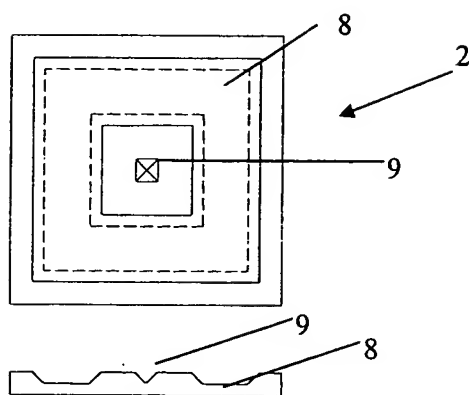


FIG. 1(D)(1)

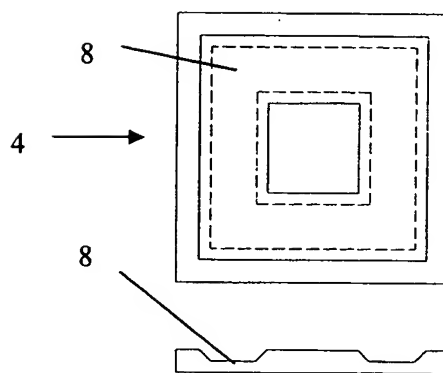
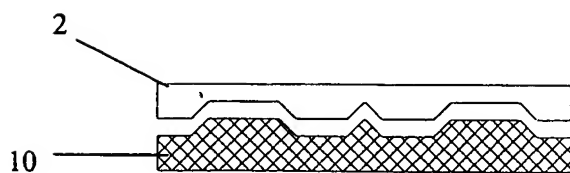
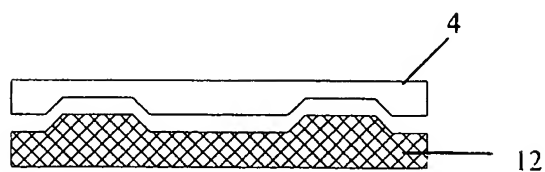


FIG. 1(D)(2)



Si

FIG. 1(E)(1)



PMMA

FIG. 1(E)(2)

 Metal
  PMMA

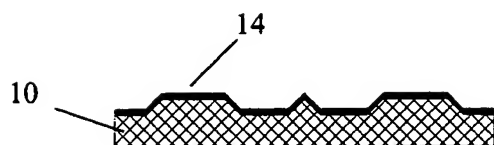


FIG. 1(F)(1)

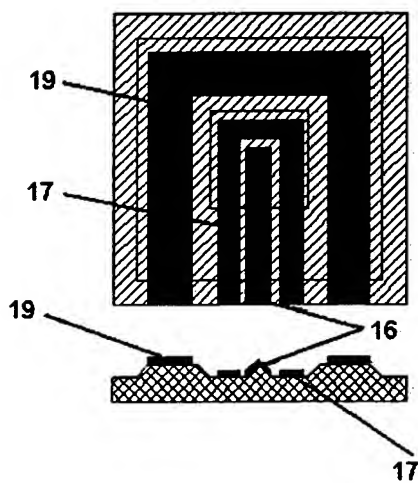


FIG. 1(G)(1)

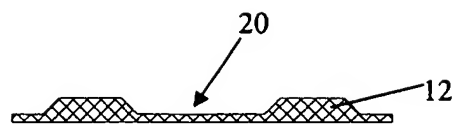


FIG. 1(F)(2)

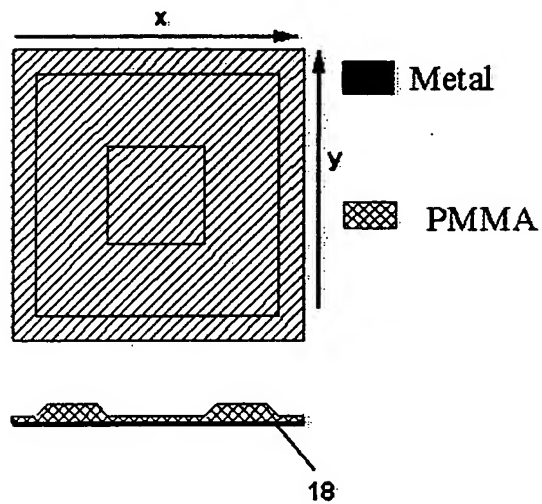


FIG. 1(G)(2)

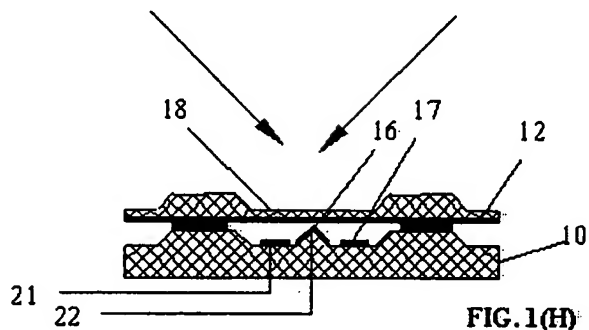


FIG. 1(H)

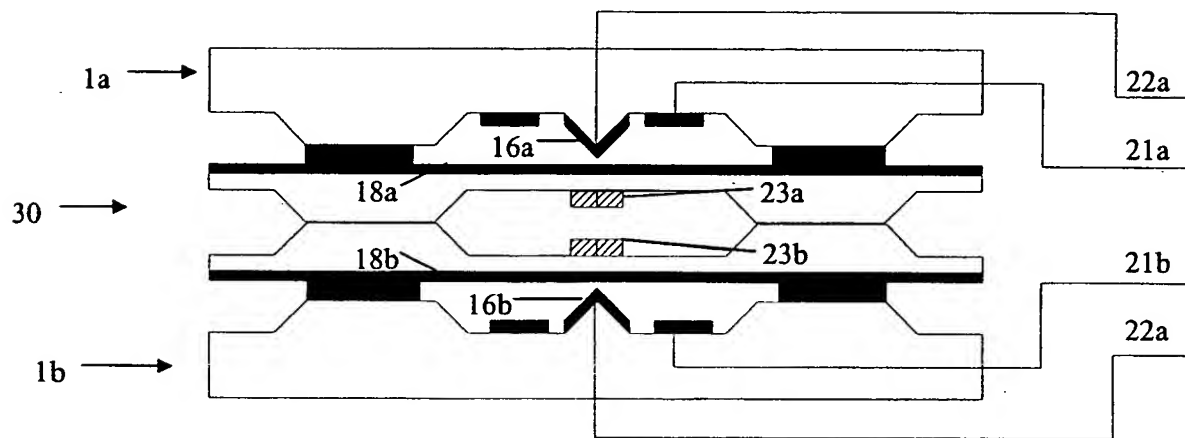


FIG. 2(A)

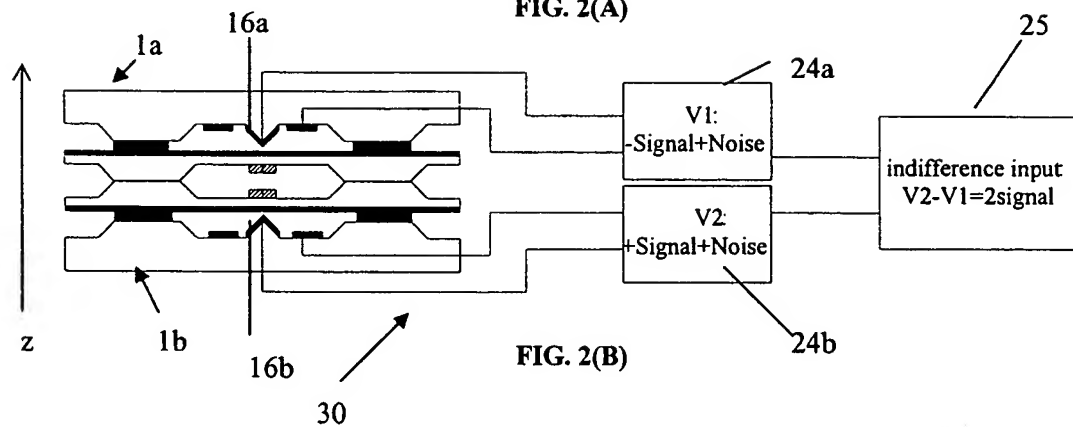


FIG. 2(B)

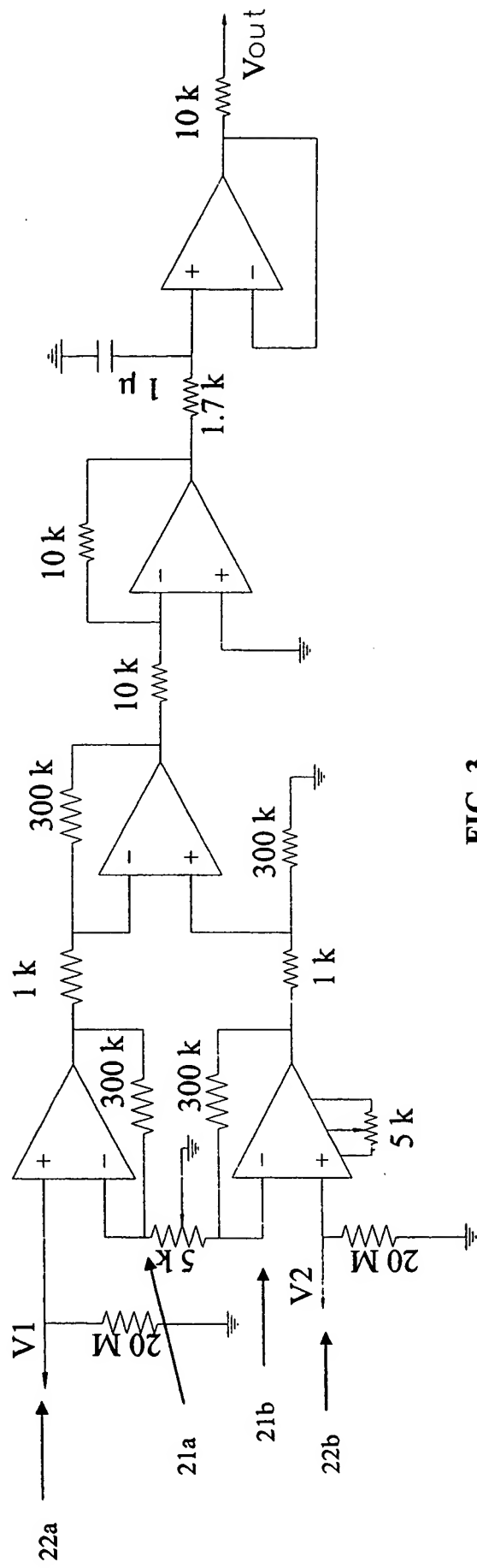
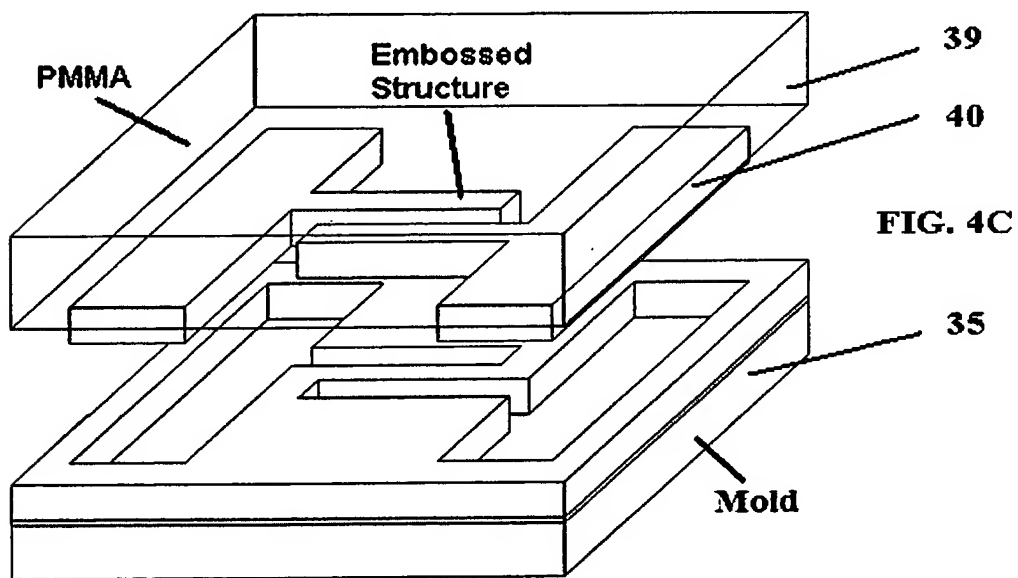
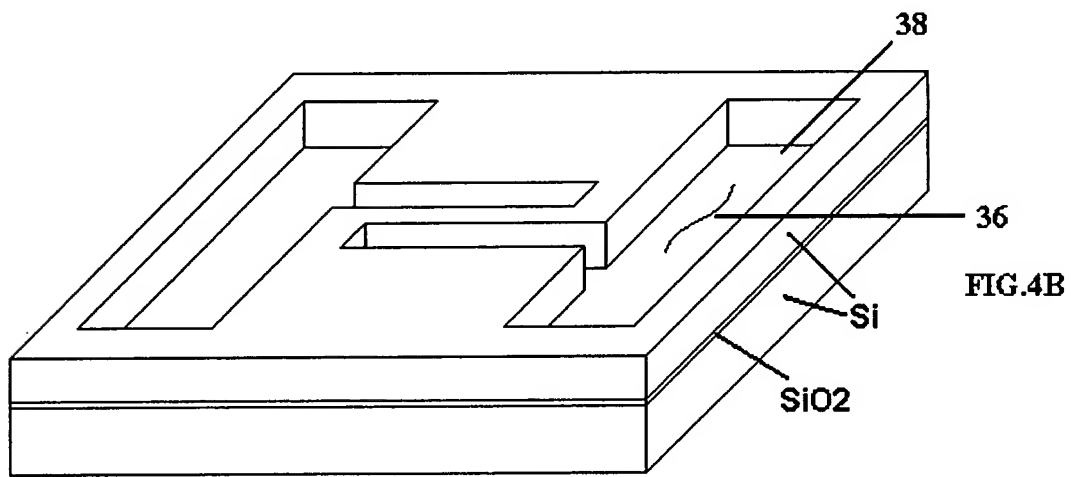
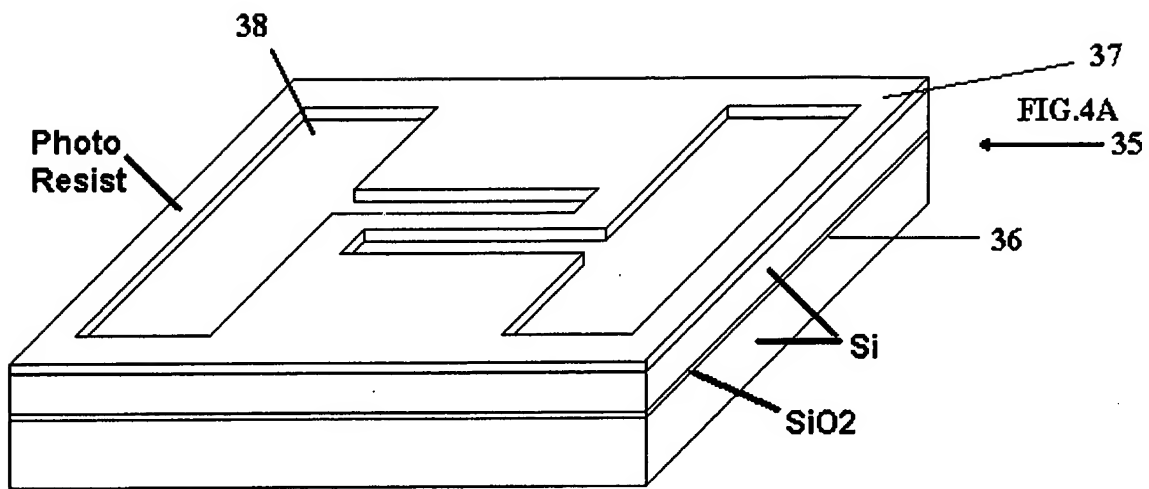
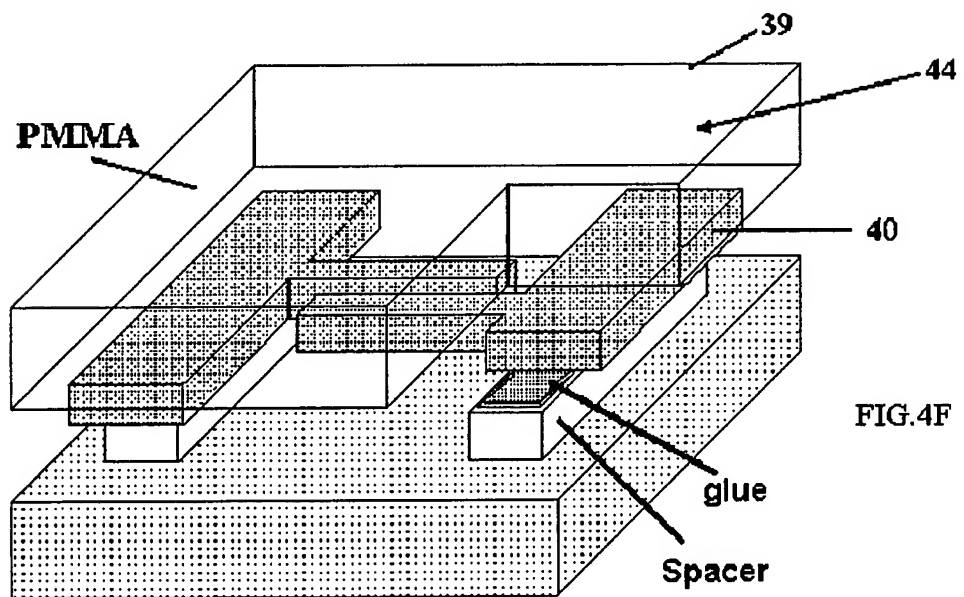
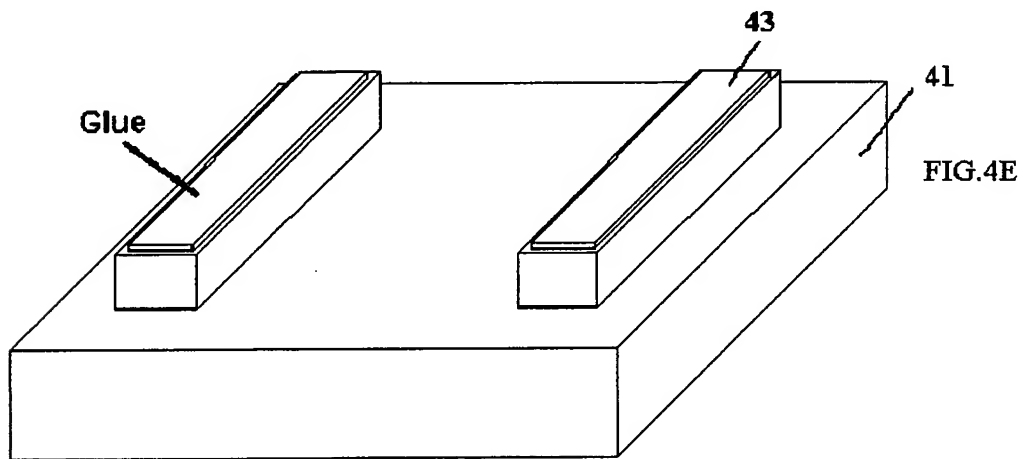
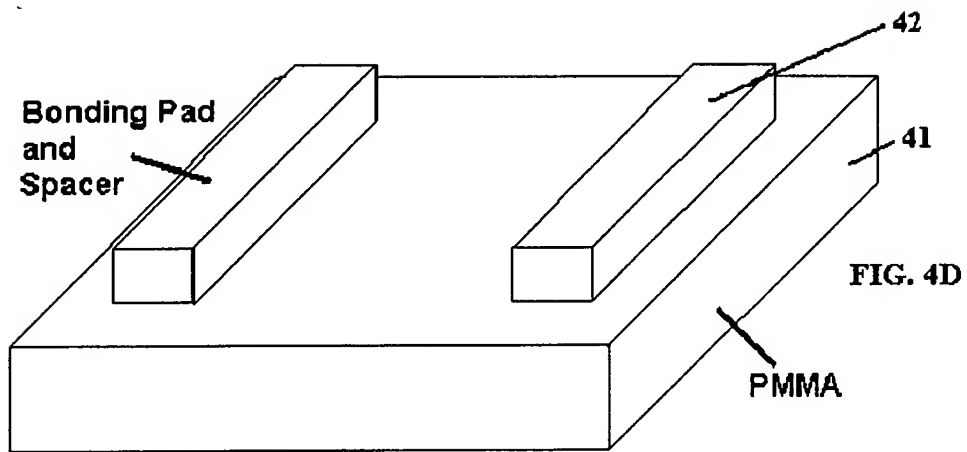
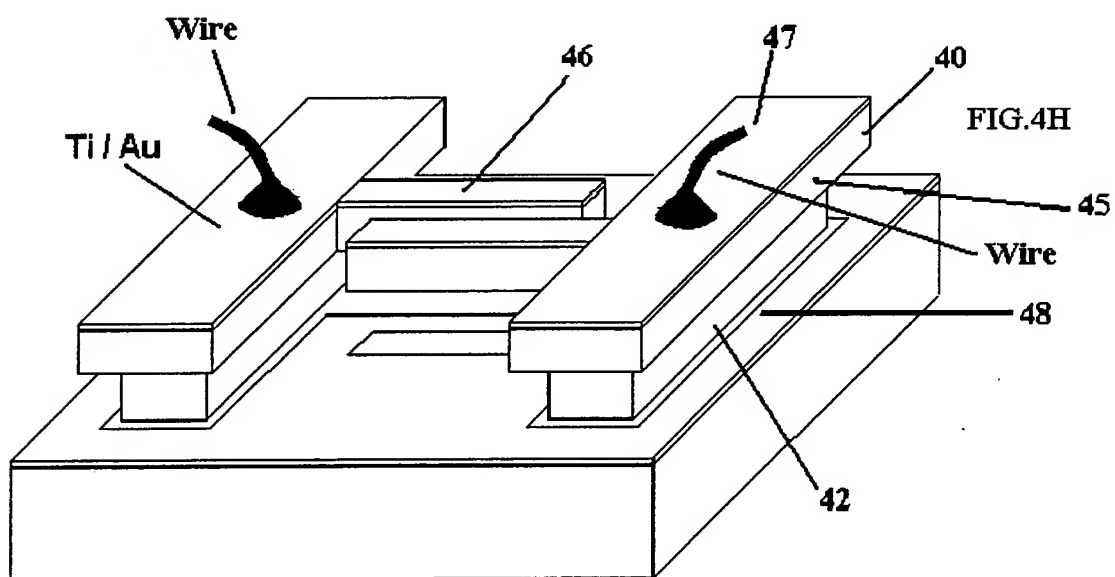
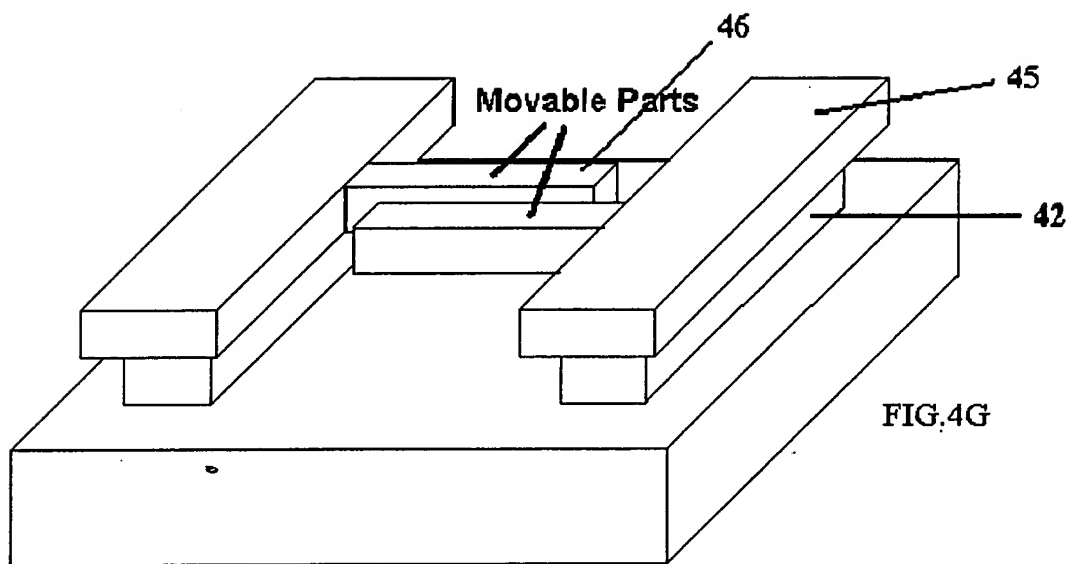


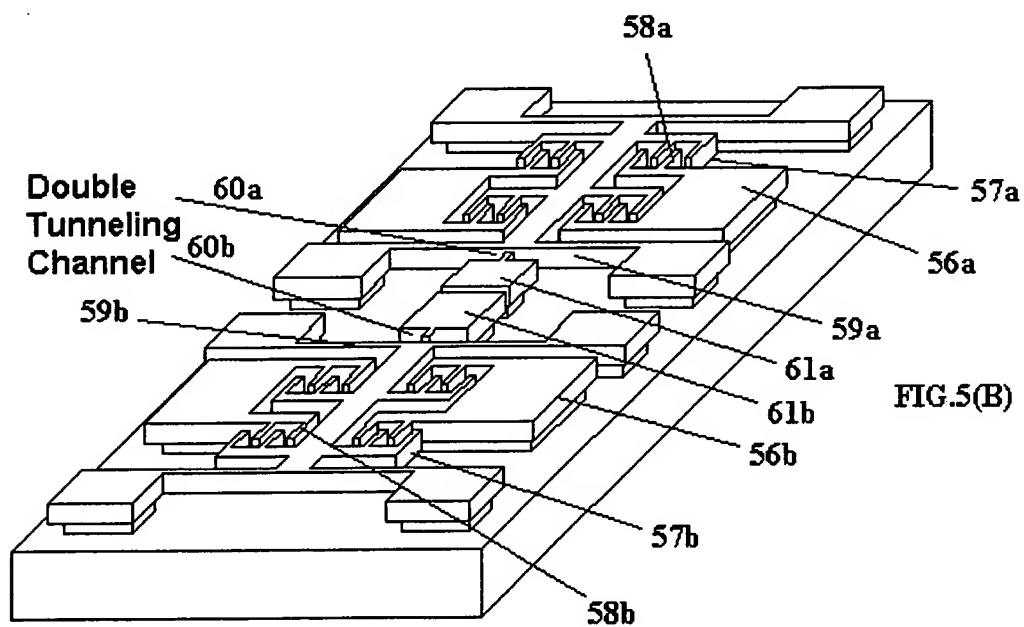
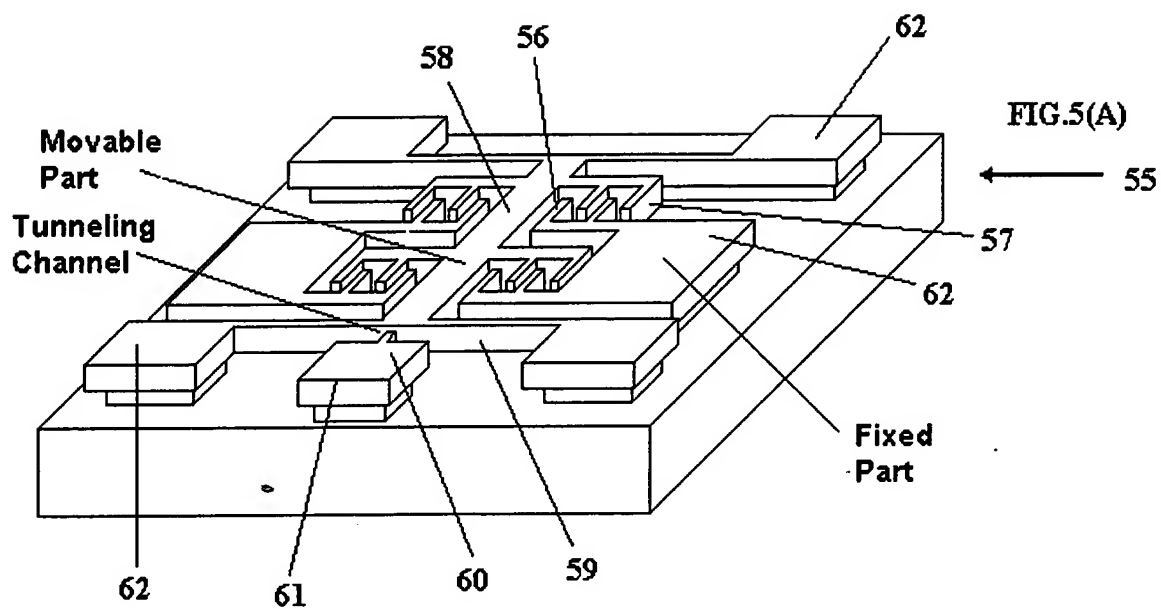
FIG. 3











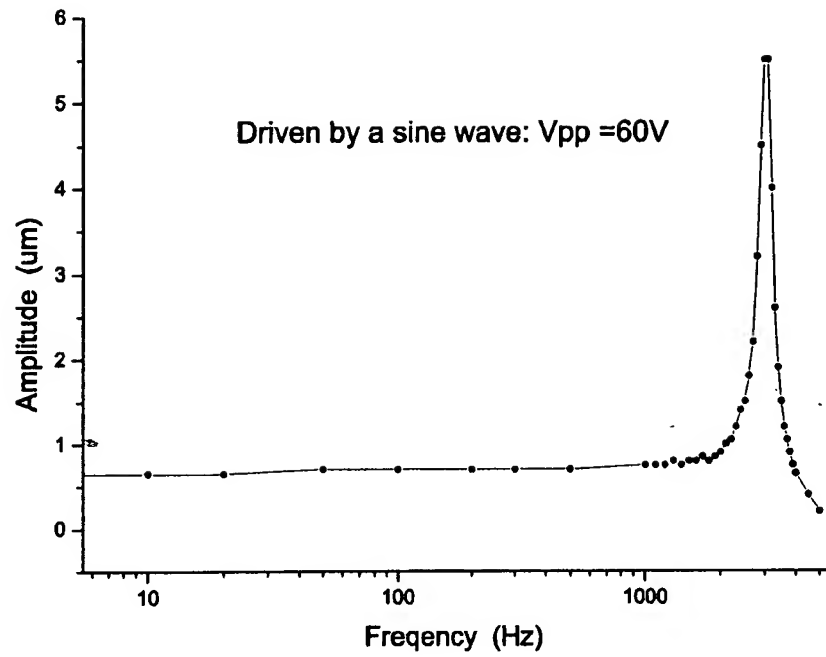


FIG.6

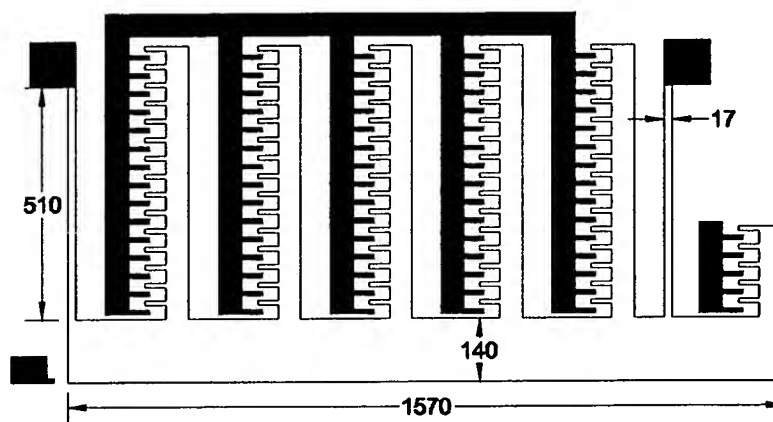
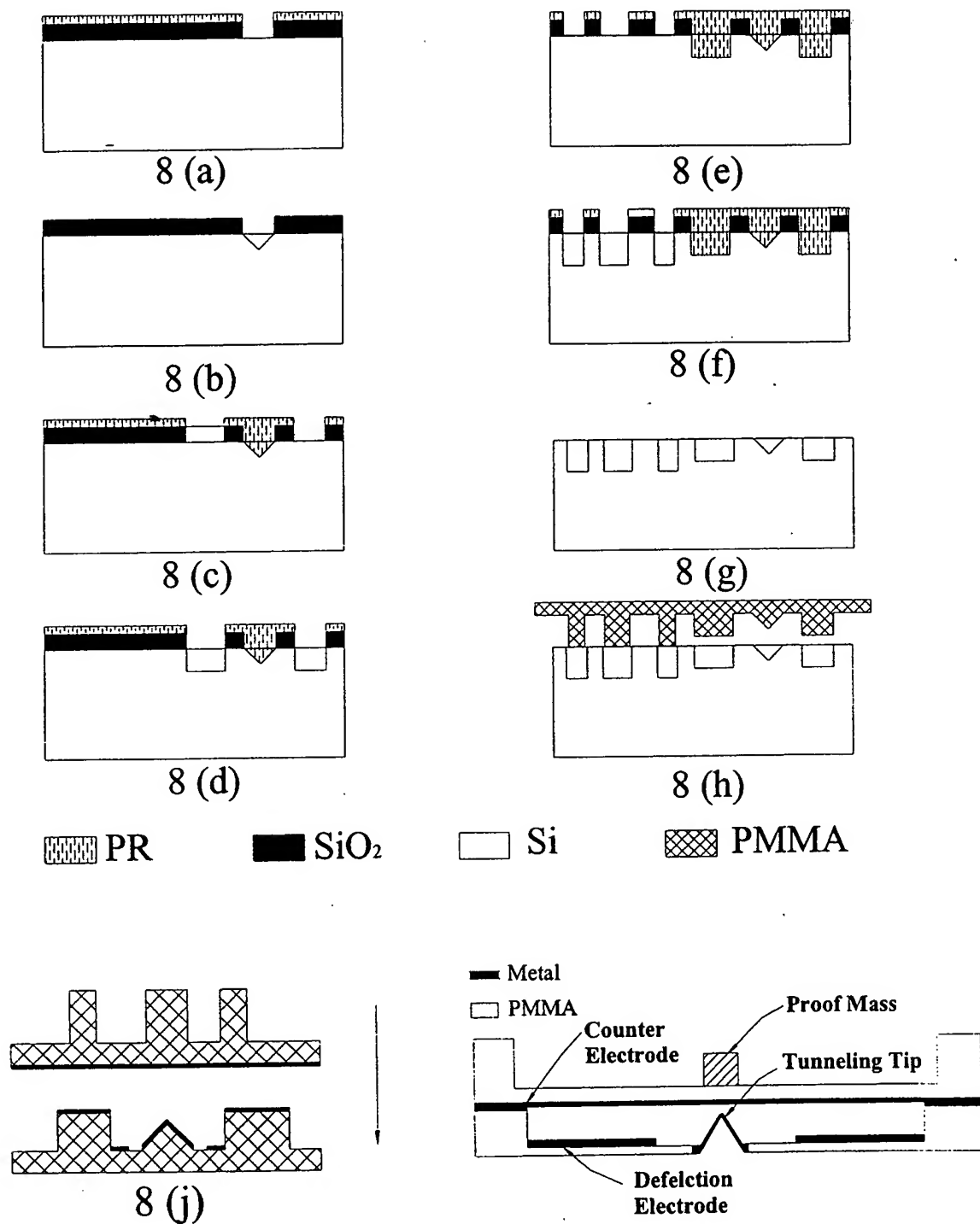
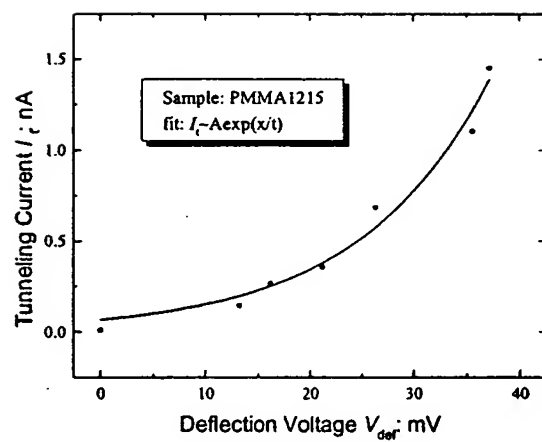


FIG.7



**FIG. 8 (k)**  
Cross section of a membrane type PMMA-based tunneling sensor



**FIG. 9** The exponential relationship between tunneling currents and applied deflection voltages